Name: Date:

Polynomial Operations EXAM (version 116)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = 5x^5 - 4x^4 - 10x^3 + 2x - 1$$

$$q(x) = -5x^5 - 7x^4 - 8x^3 + x^2 - 9$$

Express the sum of $p(x) + q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = 6x^2 - 3x + 2$$

$$b(x) = -5x + 8$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^6$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned} f(x) &= -2x^3 - 19x^2 - 24x + 2 \\ g(x) &= x + 8 \end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x+8}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R.

5. Let polynomial $f(x)$ still be defined as $f(x) = -2x^3 - 19x^2 - 24x + 2$. Evaluate $f(-8)$.